

CLAIMS

1. (Currently Amended) A process for producing a non-aqueous sol-gel spin-on glass material comprising a hybrid glass/polymer material, by reacting an alkyl ~~substituted~~ trialkoxysilane, ~~or an~~ alkyl dialkoxysilane or a dialkyl ~~substituted~~ dialkoxysilane with a silane diol, wherein said alkyl group has from 1 to 8 carbon atoms, wherein the reaction of the alkyl ~~substituted~~ trialkoxysilane, ~~or~~ alkyl dialkoxysilane or dialkyl ~~substituted~~ dialkoxysilane silane with the silane diol is carried out in a non-aqueous medium in the presence of a catalyst, wherein the catalyst is selected from: a) a tin catalyst or b) a dibutyltin diluarate, titanium isopropoxide, acetic acid or trifluoroacetic acid catalyst.
2. (Original) The process of claim 1, wherein the silane diol is a diphenylsilanediol, a 1,3-Bis (3-hydroxypropyl) tetramethoxysilane, a 1,3-Bis (4-hydroxybutyl) tetramethylsilane, a fluorinated silane diol, or a mixture of one or more of these silane diols.
3. (Original) The process of claim 1, wherein the alkyl group is replaced with a methacryloxypropyl, acryloxypropyl, or epoxy moiety.
4. (Canceled)
5. (Currently Amended) The process of claim 1, wherein the trialkoxysilane has 1 C₁ to C₈ alkyl or methacryloxypropyl groups on the same molecule ~~or and the~~ dialkoxysilane has 1 to 3 2 C₁ to C₈ alkyl, or methacryloxypropyl ~~and/or alkoxy~~ groups on the same molecule.
6. (Canceled)
7. (Canceled)
8. (Canceled)

9. (Original) The process of claim 1, further comprising adding a UV light blocking material and/or an oxygen scavenger.

10. (Original) The process of claim 1, further comprising adding a light-scattering material.

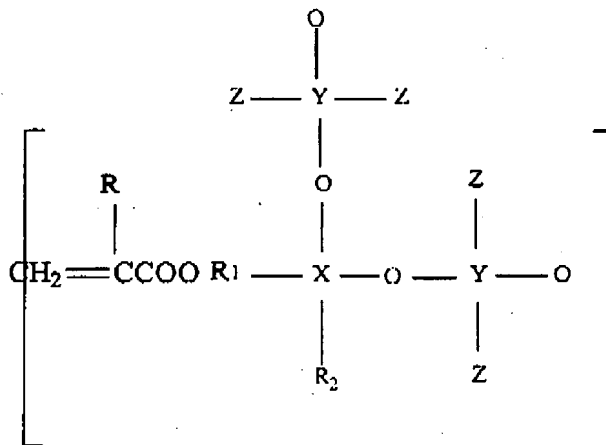
11. (Original) The process of claim 1, further comprising adding a coupling agent.

12. (Original) The process of claim 11, wherein the coupling agent is a dibutoxyaluminoxetriethoxysilane, a mixture of zirconium isopropoxide and methacrylic acid, or another transition metal propoxide.

13-17 (Canceled)

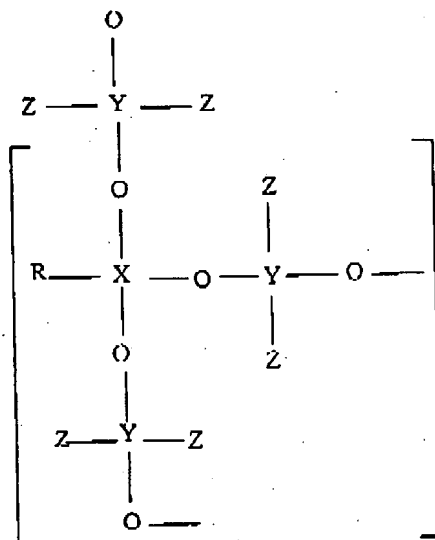
18. (Currently Amended) A non-aqueous sol-gel spin-on glass material comprising a hybrid glass/polymer material containing a phosphor dopant, which consists essentially of a YAG base phosphor or moisture sensitive phosphor nano-particles ~~or an organic material selected from organic dyes or metal complexes~~, said sol-gel spin-on-glass material selected from the group having the following formulas:

Formula I

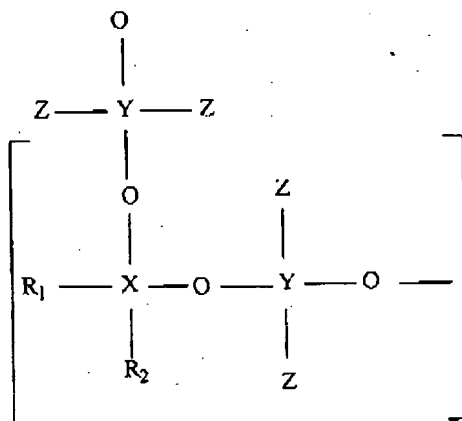


Where R = Hydrogen, C₁-C₈ Alkyl, Halogenated C₁-C₈ Alkyl or Glycidyoxyalkyl

R_1 = Ethyl, Propyl, another C_1 - C_8 Alkyl, Halogenated C_1 - C_8 Alkyl, Phenyl, or Halogenated Phenyl
 R_2 = Methyl, Ethyl or another C_1 - C_8 Alkyl
 X, Y = Si, Ge, Ti or Sn
 Z = Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

Formula II

Where R = Methacryloxyalkyl, Acryloxyalkyl or Glycidyoxyalkyl
 R_1 = Phenyl or Substituted Phenyl, Ethyl, Propyl or another C_1 to C_8 Alkyl, or Trifluoroalkyl
 X, Y = Si, Ti, Ge or Sn
 Z = Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

Formula III

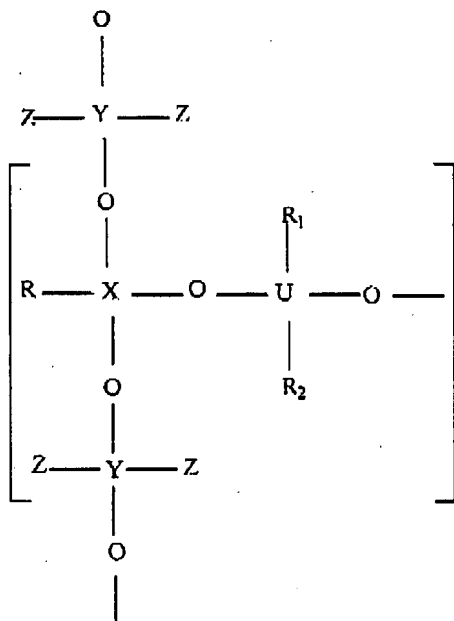
Where R_1 = Phenyl or Substituted Phenyl, Ethyl, Propyl or another C_1 to C_8 Alkyl, or Trifluoroalkyl

R_2 = Methyl, Ethyl or another C_1 to C_8 Alkyl

X, Y = Si, Ge, Ti or Sn

Z = Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

Formula IV



Where R = Methacryloxyalkyl, Acryloxyalkyl or Glycidyoxyalkyl

R_1 = Phenyl or Substituted Phenyl, Ethyl, Propyl or another C_1 to C_8 Alkyl, or Trifluoroalkyl

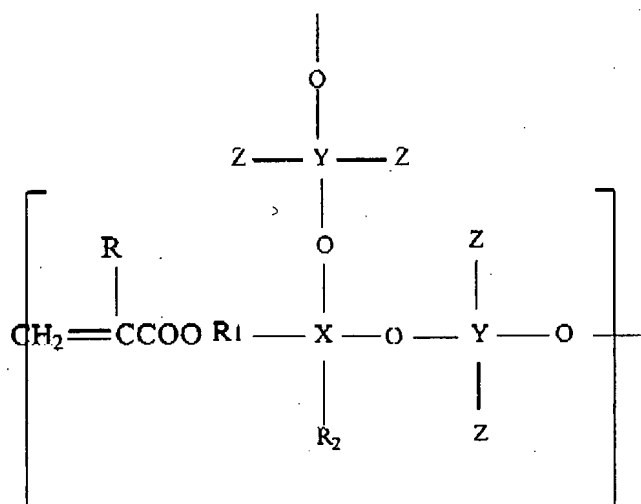
R_2 = Methyl, Ethyl or another C_1 to C_8 Alkyl or Phenyl

X, U, Y = Si, Ge, Ti or Sn

Z = Alkyl, Substituted Alkyl, Phenyl, Substituted Phenyl

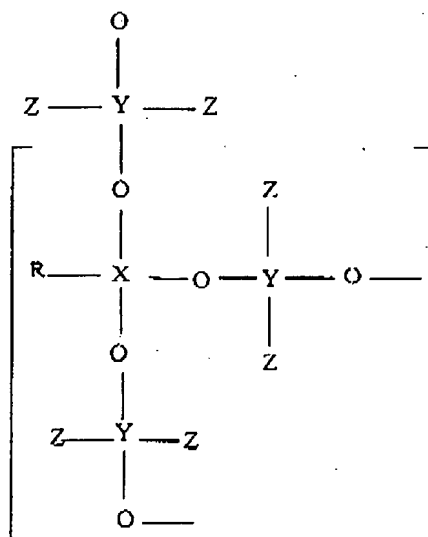
19. (Previously Amended) The non-aqueous sol-gel spin-on glass material of claim 18, having the following formula:

Formula I

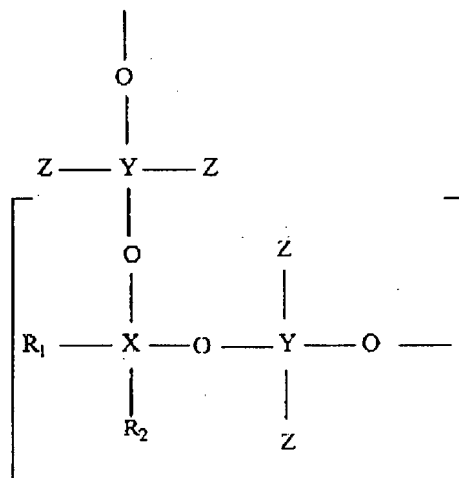


20. (Previously Amended) The non-aqueous sol-gel spin-on glass material of claim 18, having the following formula:

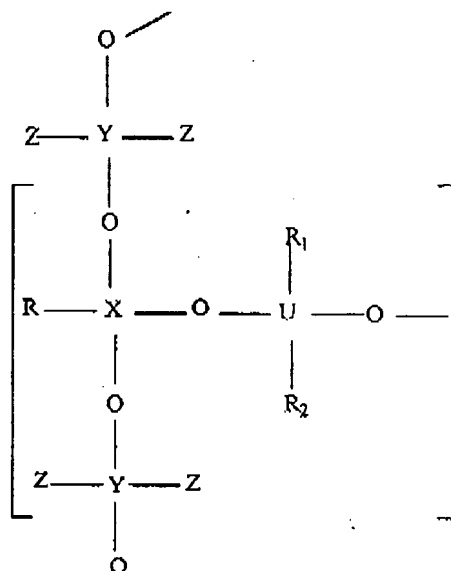
Formula II



21. (Previously Amended) The non-aqueous sol-gel spin-on glass material of claim 18, having the following formula:

Formula III

22. (Previously Amended) The non-aqueous sol-gel spin-on glass material of claim 18 having the following formula:

Formula IV

23-25 (Canceled)

26. (Previously Amended) The non-aqueous sol-gel spin-on glass material of claim 18, further comprising a UV light blocking material and/or an oxygen scavenger.
27. (Previously Amended) The non-aqueous sol-gel spin-on glass material of claim 18, further comprising a light-scattering material.
28. (Withdrawn-Previously Amended) A process for patterning the non-aqueous sol-gel spin-on glass material of claim 17 comprising: a) coating a substrate with said material followed by soft baking at 110°C (1hr), 120°C (1-2 hr); b) exposing the coated substrate of step a) to UV illumination in a desired pattern; c) post-exposure baking the coated substrate of step b) at a temperature from 100°C to 120°C for 30 to 60 minutes; d) cooling the coated substrate of step c) to room temperature; e) removing the non-exposed areas of the coating on the coated substrate of step d); f) drying the coated substrate of step e); g) hard baking the coated substrate of step f) at a temperature from 120 °C and 150 °C for 1 to 3 hours.
29. (Withdrawn-Previously Amended) The process of claim 28, wherein the non-exposed areas of the coating on the coated substrate are removed by developing in a suitable organic solvent.
30. (Withdrawn-Previously Amended) The process of claim 29, wherein in step e) the organic solvent is tetrahydrofuran, methylethylketone, acetone, n-propylacetate, or mixture of these solvents.
31. (Withdrawn-Previously Amended) The process of claim 28, wherein in step f) the coated substrate is dried by flushing with a non-reactive gas.
32. (Withdrawn-Previously Amended) The process of claim 28, wherein in step a) the substrate is glass, quartz, sapphire, silicon, a metalized substrate or a polymeric film.

33. (Withdrawn-Previously Amended) The process of claim 28, wherein in step a) the coating is carried out by spin coating, dip coating, spray coating or doctor blade coating.

34. (Canceled)

35. (Currently Amended) A process for producing the non-aqueous sol-gel spin-on glass material of claim 18, the process comprising reacting an alkyl substituted trialkoxysilane, ~~or an alkyl substituted dialkoxysilane~~ or a dialkyl substituted dialkoxysilane with a silane diol, wherein said alkyl group has from 1 to 8 carbon atoms, wherein the reaction of the alkyl substituted trialkoxysilane, ~~or alkyl substituted dialkoxysilane~~ or dialkyl substituted dialkoxysilane silane with the silane diol is carried out in a non-aqueous medium in the presence of a catalyst, the process further comprising adding to said sol-gel spin-on glass material a phosphor dopant, which consists essentially of a YAG base phosphor ~~or moisture sensitive phosphor nano-particles or an organic material selected from organic dyes or metal complexes.~~

36. (Canceled)